Couples becoming parents

Couples Becoming Parents: Trajectories for Psychological Distress and Buffering Effects of Social Support

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Highlights

- Expectant mothers show greater psychological distress than expectant fathers
- Mothers' average psychological distress is stable across early parenthood
- In contrast, becoming a parent evokes psychological distress in fathers.
- Key sources of support include friends for mothers but family for fathers
- Maternal prenatal cortisol is linked to concurrent distress in mothers

Abstract

Background: Becoming a parent is a time of both joy and stress. Associations between exposure to postnatal depression and negative child outcomes underscore the importance of understanding trajectories and correlates of perinatal depression and anxiety.

Methods: In a study of 438 expectant couples (from the UK, USA and Netherlands) tracked across four time-points (third trimester, 4, 14 and 24 months), we used dyadic latent growth curve modelling (LGCM) of self-reported symptoms of anxiety and depression (CES-D, GHQ, STAI) to investigate the affective impact of becoming a parent.

Results: Confirmatory factor analyses of anxious-depressive symptoms revealed a single latent factor with measurement invariance across time and parent. Dyadic LGCM intercepts showed greater prenatal problems in mothers compared with fathers. LGCM slopes revealed stable maternal problems but worsening paternal problems. Both intercepts and slopes showed significant within-couple associations. Controlling for prenatal salivary cortisol levels and perinatal couple relationship quality, support from friends attenuated mothers' psychological distress and support from family reduced fathers' psychological distress across the transition to parenthood.

Limitations: Our sample was low risk (i.e., predominantly well-educated and affluent and no history of serious mental illness), limiting the generalizability of findings. In addition, the inverse association between psychological distress and social support may, in part, reflect the use of self-report for both measures.

Conclusions: The international dyadic longitudinal design strengthens conclusions regarding variation in trajectories of psychological distress in both mothers and fathers. Crucially, social support appears pivotal in enabling new parents to flourish.

Key words: transition to parenthood, psychological distress, fathers, social support, latent growth curve model.

Couples Becoming Parents: Trajectories for Psychological Distress and Buffering Effects of Social Support

While often eagerly awaited, the transition to parenthood can lead to psychological distress in both mothers and fathers, with adverse effects for infants (for systematic reviews, see Cameron, Sedov, & Tomfohr-Madsen, 2016; Stein et al., 2014; Sweeney & MacBeth, 2016; Woody, Ferrari, Siskind, Whiteford, & Harris, 2017). In turn, exposure to post-partum mood disturbance predicts diverse adverse offspring outcomes (Sweeney & MacBeth, 2016), including poor attunement with caregivers (e.g., Hendrix, 2018), long-term risk for psychiatric disturbance (e.g., Halligan, Murray, Martins, & Cooper, 2007), impaired executive function (e.g., Hughes, Roman, & Ensor, 2013) and poor academic achievement (e.g., Murray et al., 2010). These adverse effects depend on chronicity of exposure (Ahun et al., 2017; van der Waerden et al., 2017), such that understanding contextual influences on symptom trajectories is a key research challenge.

Factors Associated with Psychological Distress in the Perinatal Period

Couple satisfaction often shows a marked decline across the transition to parenthood (C. Cowan & Cowan, 1992; Mitnick, Heyman, & Smith Slep, 2009), which can result in psychological distress (Bodenmann & Randall, 2013). Negative changes in relationships with friends and/or extended family also predict problems of anxiety or depression in new parents (Bost, Cox, Burchinal, & Payne, 2002). Yet surprisingly few studies have examined buffering effects of specific relationships. Indeed, it is not clear whether specific sources of social support are distinct from each other, similar for mothers and fathers and important beyond the first 12 months postpartum (Wee, Skouteris, Pier, Richardson, & Milgrom, 2011). Likewise, although animal studies have documented complex neurobiological modifications associated with the mammalian transition to parenthood (Lambert, 2012), biological factors have yet to be properly integrated within psychosocial studies of distress in the perinatal period (Yim,

Tanner Stapleton, Guardino, Hahn-Holbrook, & Dunkel Schetter, 2015). Addressing these twin gaps, the present study aimed to elucidate the affective impact of psychosocial and biological factors across the transition to parenthood.

Measuring Psychological Distress in New Fathers and Mothers

Psychological distress is more prevalent in women than in men (for a detailed discussion see Freeman & Freeman, 2013); the *type* of symptoms of psychological distress also show notable gender differences (e.g., Rice, Fallon, Aucote, & Möller-Leimkühler, 2013). However, very few studies include direct comparisons of mothers and fathers (Wee et al., 2011). Indeed, few studies have examined whether existing self-report measures are equally appropriate for use with men and women; this is surprising as some items (e.g., crying) may not reflect men's experiences of depression (Domoney, Iles, & Ramchandani, 2017). Alongside contrasts in how items are interpreted, the willingness to endorse items related to distress may differ by gender and across distinct points in the life-span. Highlighting the significance of these differences, contrasts in how people interpret and respond to questionnaire items have been shown to threaten the validity of findings from cross-cultural studies (Chen, 2008). A preliminary goal of the present study was therefore to test for measurement invariance in order to establish the conceptual equivalence of self-reported scores for well-being in new mothers and fathers.

Alongside common effects in reducing couple relationship quality, the transition to parenthood brings several life-changes that may differ for new mothers and fathers. For example, the transition to parenthood often brings increased inequality in the division of household labour (Bianchi & Milkie, 2010), such that detrimental effects on well-being may be more common in new mothers than new fathers. In addition, mothers and fathers may experience distinct buffering effects of specific sources of social support (e.g., partners, friends, family) (e.g. Eastwood, Jalaludin, Kemp, Phung, & Barnett, 2012). For example,

secondary data analysis from a longitudinal study of 137 new parents (e.g., Bost et al., 2002) points to the differential salience of friends for new mothers and family for new fathers. However, these data were collected three decades ago, a period that has seen marked societal changes in fathers' involvement in childcare (Raley, Bianchi, & Wang, 2012). Note also that Bost et al. (2002) did not attempt to assess well-being *trajectories* for mothers and fathers. Addressing this gap, the current study focused on predictors of wellbeing trajectories, with a particular focus on establishing similarities and contrasts between mothers and fathers regarding the nature and strength of associations with social support. At this point it is worth noting that the transition to parenthood typically involves a substantial reduction in working hours for new mothers (Paull, 2008), which can lead to increased pressure on new fathers to become the key earner, perhaps at the cost of reduced family time (Raley et al., 2012). Paternal involvement was therefore included as a covariate in the current study, in order to control for between-family variation in paternal involvement in childcare.

Measuring Physiological Markers of Stress in New Fathers and Mothers

While most studies of the affective impact of becoming a parent still rely exclusively on self-report measures, technological advances have greatly increased the accessibility of physiological markers (e.g., diurnal variation in saliva concentrations of the stress hormone cortisol), leading to improvements in our understanding of the complex and dynamic mechanisms underpinning individuals' reactions to stress. For example, recent findings from a prospective study of 90 participants followed from birth to age 37 provide support for a 'sensitisation' model, in which stress in the first 5 years of life, combined with current stress predicted reduced diurnal variation in salivary levels of cortisol (Young et al., 2019). Importantly for the current study, salivary levels of cortisol in pregnant women do not appear associated with concurrent self-reported stress (Voegtline et al., 2013) but are, nevertheless, related to infant outcomes (Davis, Glynn, Waffarn, & Sandman, 2011).

As recently reported elsewhere (Braren et al., 2020), the current study included measures of prenatal cortisol in both expectant mothers and expectant fathers. Multi-level models showed significant positive within-couple diurnal cortisol linkage for the sample overall that was especially strong for couples with higher maternal psychological distress (i.e., expectant mothers who report symptoms of distress were more likely to display physiological markers of stress in the context of high partner physiological stress). As Braren et al. (2020) conclude, these findings indicate that physiological linkage is an interpersonal process, for better and for worse. Building on these results, the current study examined maternal and paternal prenatal cortisol as predictors of postnatal wellbeing trajectories.

In sum, by integrating psychosocial and biological perspectives (Yim et al., 2015), our prospective longitudinal study of first-time mothers and fathers in heterosexual partnerships is uniquely positioned to assess across-parent similarities and contrasts in the buffering effects of different sources of social support on the psychological impact of becoming a parent. Based on reported differences in wellbeing between mothers and fathers in early parenthood (e.g., Paulson & Bazemore, 2010) and in work-family conflict (e.g., Gornick & Meyers, 2008), we expected mothers to show greater psychological distress than fathers. In addition, based on affective similarities between spouses in existing longitudinal studies of older adults (e.g., Desai, Schimmackm, Jidkova, & Bracke, 2012), we predicted positive and significant within-couple associations in initial levels of psychological distress (for both subjective and physiological measures) and in gradients of change, as assessed using latent growth curve models. Finally, we aimed to test the unique influences of friendship support and family support on parental psychological distress, including couple relationship quality and prenatal salivary cortisol as covariates in our longitudinal dyadic model.

Method

Participants and Protocol

We recruited 484 expectant couples attending antenatal clinics and parenting fairs in the East of England, New York State and the Netherlands. Our rationale for this three-site design was to maximize the number of families meeting eligibility criteria. These included: (1) cohabiting first-time parents, (2) English (or Dutch) as a primary home language, (3) no history of severe mental illness / substance misuse and (4) expected delivery of a healthy singleton baby (as well as confirmation from a health professional that both mother and baby were both healthy). Mothers were, on average 32.24 years old, *SD* = 3.92, range: 21.16 – 43.76 years, and fathers were 34.07 years old, *SD* = 4.73, range: 23.10 – 55.95 years. Across sites, both mothers and fathers had high levels of educational attainment: 84.3% of mothers and 76.3% of fathers had an undergraduate degree or higher. The sample was ethnically homogenous: 89% of mothers and 92% of fathers were white.

The National Health Service (NHS UK) Research Ethics Committee and (names blinded) Institute Review Boards approved our study protocol. Expectant parents completed an online questionnaire and were interviewed at home approximately one month before their infant's due date. Parents were later invited to complete the same questionnaires during follow-up waves at 4-, 14 and 24-months. Ten families became ineligible at the 4-month time point due to birth complications or long-distance move. Of the remaining 474 families, 445 (93.8%; 224 boys, 221 girls) agreed to a home visit (M_{Age} = 4.26 months, *SD* = 0.46 months, range: 2.97 – 6.23 months). At the 14-month time point, 13 of the 451 remaining families became ineligible for follow-up due to having left the country, 6 families withdrew and 6 families who missed appointments at 4-months took part. Thus, 422 out of 438 eligible families (96.3%; 214 boys, 208 girls) took part (M_{Age} = 14.42 months, *SD* = 0.57 months, range: 9.47 – 18.40 months). At the final 24-month time point, 12 of the remaining 438

families became ineligible, 16 families declined to take part and 10 families returned to the study having missed their previous appointment. Thus, 404 out of 426 eligible families (94.8%) took part when their children (209 boys, 195 girls) were 24 months old, M_{Age} = 24.47 months, *SD* = 0.78 months, range: 19.43 – 26.97 months.

Measures

At each time point, mothers and fathers completed the 20-item Centre for Epidemiological Studies Depression Scale (CESD20; Radloff, 1977), the 12-item General Health Questionnaire (GHQ12; Goldberg et al., 1997) and the 6-item State-Trait Anxiety Inventory (STAI6; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) as well as the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988). For all measures, summed scores showed excellent internal consistency in mothers and fathers across all time points (see Table 1).

Salivary cortisol. At the prenatal time point, participants received instructions and equipment to self-administer saliva collection procedures at three time points on two consecutive days, typical days following the home visit. Samples were meant to be taken immediately upon waking, 30 minutes after waking, and immediately before sleep. This involved placing a 30mm cotton swab beneath the tongue for two minutes before immediately placing it in a storage tube in the home freezer prior to collection by research staff. After collection, samples were immediately placed on ice, then stored frozen (−20°C) until shipped on dry-ice. Samples were then stored frozen at −80°C until assayed. Saliva samples were shipped to and assays were conducted at Universität Trier, Germany. All samples were assayed in duplicate; the two values for each sample were averaged.

Of the 438 eligible families, 85.2% (*N* = 373) returned all three samples for at least one day for each parent. Cortisol values were normally distributed. Outliers greater than +/- 3 standard deviations from the mean were treated as missing (*n* = 10 maternal samples; *n* = 16

paternal samples.) Participants who did not report collecting the first sample within 15 minutes of waking (n = 115 maternal samples; n = 108 paternal samples) or the second sample between 15 and 45 minutes after waking (n = 154 maternal samples; n = 144 paternal samples) were also treated as missing. Area under the curve with respect to ground was computed for all remaining samples (Pruessner, Kirschbaum, Meinlschmid, & Hellhammer, 2003).

Covariates. Parents reported their highest level of educational attainment during the prenatal phase and their age at the birth of their first child. At each time-point parents completed the Ladder of Subjective Social Status (Singh-Manoux, Adler, & Marmot, 2003), to indicate their self-perceived education, income and employment, and the Conflict Tactics Scale (CTS; Straus, 1979), to measure of couple conflict (high total scores indicating lower levels of conflict). Mothers' and fathers' average level of perceived social standing and couple conflict across the three postnatal waves showed acceptable internal consistency (Table 1). Maternal and paternal ratings on the 'Who Does What Questionnaire' (P. Cowan & Cowan, 1990) were averaged within each time-point and then across the three postnatal time-points to create a single paternal involvement in childcare score (high scores indicating greater paternal involvement).

Results

Analysis Strategy

We analysed the data using a latent variable framework in M*plus* (Version 8) (Muthén & Muthén, 2012). We used confirmatory factor analysis (CFA) to test measurement models and compare mean maternal and paternal levels for each of the focal constructs (i.e., family support, friendship support, anxious-depressive symptoms). We examined the measurement invariance of each of these models across mothers and fathers and in the case of anxious-depressive symptoms, over time. We used latent growth curve models (LGCM) to examine

initial levels and trajectories of anxious-depressive symptoms in mothers and fathers across the transition to parenthood and conditional LGCM to examine correlates of initial levels and predictors of change in symptoms. We used a maximum likelihood estimator with robust standard errors (MLR) in each of our models (Kline, 2012) and evaluated model fit using three primary criteria: Comparative Fit Index (CFI) > .90, Tucker Lewis Index (CFI) > .90, Root Mean Square Error of Approximation (RMSEA) < .08 (T. Brown, 2015). Nested model comparisons were judged to be significant if the CFI decreased by > 0.002 and there were significant changes in the Sartorra-Bentler scaled χ^2 difference test (Meade, Johnson, & Braddy, 2008). We used a full information approach under the assumption that data were missing at random so that all eligible families who participated in the prenatal and at least one follow-up phase (N = 438) were included (see Online Supplementary Material) (Geiser, 2013).

Measurement Equivalence of Anxious-Depressive Symptoms Across Mothers and Fathers and Over Time

The Online Supplementary Material includes a description of how we created the anxious-depressive symptom latent factors for mothers and fathers across the four time points of the study. Since mothers and fathers in our study were nested within couples (i.e., non-independent), we tested the invariance of anxious-depressive symptom latent factors using methods traditionally applied to repeated-measures data. We imposed equality constraints on the anxious-depressive symptom latent factors both across informants and over time (see Table S1). A partial measurement invariance model (in which these parameters were free to vary – see Online Supplementary Materials) provided a good fit to the data, $\chi^2(263)$ = 400.911, p < .0001, RMSEA = 0.035, CFI = 0.967, TLI = 0.966. Table S2 shows the results of model comparisons testing latent factor mean differences within participants (over time) and between mothers and fathers.

Trajectories of Anxious-Depressive Symptoms Across the Transition to Parenthood

Having established the partial longitudinal invariance of the anxious-depressive symptoms latent factor in mothers and fathers, we used a two-variable second-order LGCM to examine trajectories of psychological distress across the transition to parenthood. This permitted us to examine initial levels and changes in anxious-depressive symptoms in mothers and fathers accounting for the nesting of data within couples (Hoppmann, Gerstorf, Willis, & Schaie, 2011). The unconditional LGCM provided a good fit to the data, $\chi^2(285) = 463.189$, $p < .001$, RMSEA = 0.038, CFI = 0.958, TLI = 0.959. Inspection of the modification indices revealed that allowing the anxious-depressive symptom latent factors for mothers to correlate with the corresponding latent factor for fathers at Time 2 and at Time 3 would improve model fit. The revised model provided a good fit to the data, $\chi^2(283) = 439.449$, $p <.001$, RMSEA = 0.036, CFI = 0.963, TLI = 0.964. Figure 1 shows unstandardized estimates for the LGCM of (A) maternal and (B) paternal symptoms across the transition to parenthood.

The mean initial levels of anxious-depressive symptoms were significantly greater than 0 in both mothers, $M_I = 9.121$, $SE = 0.264$, $p < .0001$, and fathers, $M_I = 7.742$, $SE = 0.306$, $p < .0001$. There was substantial variability in initial levels of anxious-depressive symptoms in both mothers, $Var_I = 14.451$, $SE = 2.508$, $p < .0001$, and fathers, $Var_I = 23.759$, $SE = 3.189$, $p < .0001$. The mean of the latent slope factor did not differ from 0 in mothers, $M_S = 0.046$, $SE = 0.071$, $p = 0.513$, indicating stability in anxious-depressive symptoms across the transition to parenthood in mothers. However, the variance of the latent slope factor was significantly different from 0 indicating that there were between-person differences in the rate of change of maternal anxious depressive symptoms, $Var_S = 0.532$, $SE = 0.252$, $p = .035$. The mean of the latent slope factor in fathers was positive and significantly different from 0 indicating a tendency for anxious-depressive symptoms to increase across

the transition to parenthood among fathers, M_S = 0.420, SE = 0.086, p < .0001. Moreover, there was marked variability in paternal slopes, Var_S = 0.980, SE = 0.281, p <.0001, indicating anxious-depressive symptoms did not increase to the same extent in all fathers.

Wald Tests of model constraints revealed that the mean maternal intercept was greater than the mean paternal intercept, $\chi^2(1) = 14.03$, p = .0002, w = .179. The mean paternal slope, on the other hand, was greater than the mean maternal slope, $\chi^2(1) = 13.382$, p =.0003, w = .175. There were cross-domain correlations, indicating spousal similarities, between initial levels and slopes of anxious-depressive symptoms. Mothers with higher initial levels of anxious-depressive symptoms tended to have partners with higher initial symptom levels, r = .18, SE = .088, p = .001. Maternal and paternal slopes were also correlated, r = .43, SE = .170, p = .012. Mothers who experienced greater increases in anxious-depressive symptoms across the transition to parenthood had partners who also experienced stronger increases in anxious-depressive symptoms. Similar patterns were observed using the physiological data from the salivary cortisol measures in the prenatal phase (see Table 1). Mothers' levels of salivary cortisol prenatally were significantly higher than fathers' prenatal levels, $t(278)$ = 16.62, p < .0001, and there was a weak but significant correlation between maternal and paternal salivary cortisol levels, $r(279)$ = .14, p = 0.017.

Correlates and Predictors of Initial Symptom Levels and Symptom Trajectories in Mothers and Fathers Across the Transition to Parenthood

To investigate the predictors and correlates of both initial levels and trajectories of anxious-depressive symptoms in mothers and fathers we added time-invariant covariates to our LGCM. The model covariates included two binary dummy variables to indicate country of origin. The UK was chosen as the reference group (0). We also included two binary variables indicating whether (1) or not (0) mothers or fathers had received a diagnosis of anxiety or depression prior to their pregnancy. Parent age, education and self-reported social

standing, paternal involvement in childcare, couple conflict and prenatal salivary cortisol were also included. All non-binary covariates were mean-centered to facilitate interpretation (Newsom, 2015). The Online Supplementary Materials contain information on the construction of latent factors for couple conflict and perceived social support.

We regressed maternal latent intercepts and latent slopes onto the country dummy variables, maternal history of depression/anxiety dummy variable, maternal age, maternal education, maternal social standing, paternal involvement in childcare, maternal prenatal salivary cortisol, couple conflict and the maternal family support and friendship support latent factors. We regressed paternal latent intercepts and slopes onto the country dummy variables, paternal history of depression/anxiety, paternal age, paternal education, paternal social standing, paternal involvement in childcare, couple conflict, paternal salivary cortisol and the paternal family support and friendship support latent factors. We examined cross-domain effects by regressing the maternal latent slope onto the paternal latent intercept and the paternal latent slope onto the maternal latent intercept. The model provided an adequate fit to the data, $\chi^2(1414) = 2166.559$, $p < .001$, RMSEA = 0.035, 90%CI [0.032, 0.038], CFI = 0.918, TLI = 0.911. Table 2 shows correlations between key study measures for mothers and fathers. Table 3 shows the parameter estimates for each of the regression paths in the model.

Perceived support from friends in the perinatal period was negatively related to maternal anxious-depressive symptom slopes. Mothers with higher levels of support from friends showed decreases in anxious-depressive symptoms over the transition to parenthood, over-and-above differences in socio-demographic factors, couple conflict and a history of depression/anxiety. Perceived support from family in the perinatal period was negatively related to paternal anxious-depressive symptom slopes. Fathers with higher levels of support from their family showed decreases in anxious-depressive symptoms across the transition to parenthood, over-and-above socio-demographic factors and history of depression/anxiety.

Maternal prenatal cortisol predicted initial levels (but not trajectories) of maternal anxious-depressive symptoms. Paternal cortisol did not predict either initial levels or trajectories of paternal anxious-depressive symptoms. Figure 2 shows simple trajectories based on procedures developed by Preacher, Curran and Bauer (2006). Specifically, Figure 2A displays symptom trajectories for mothers with low or high levels of perceived support from friends. Likewise, Figure 2B displays symptom trajectories for fathers with low or high levels of perceived support from family.

Discussion

To examine initial levels and trajectories of psychological distress across the transition to parenthood, this study followed 438 heterosexual cohabiting couples across four time-points (prenatal, 4-, 14- and 24-months). Having established partial measurement invariance (across parents and time-points), we used dyadic LGCM to examine: (1) maternal and paternal trajectories in self-reported psychological distress; (2) associations between prenatal physiological stress (indexed by diurnal variation in salivary cortisol) and the intercepts and slopes for self-reported distress; (4) within-couple associations; and (5) buffering effects of social support from partners, friends and family. While initial levels of psychological distress were higher for mothers than fathers, mean levels did not change over time for mothers, but increased significantly for fathers. Even within this demographically low-risk sample, intercept and slopes showed substantial individual differences for both mothers and fathers. Elevated maternal prenatal cortisol was associated with higher self-reported prenatal distress in mothers but there was no corresponding association between paternal prenatal cortisol and self-reported prenatal distress. Significant positive within-couple associations were found for both intercepts and slopes for distress and for prenatal cortisol levels. Finally, couple conflict was associated with higher initial levels of psychological distress in both mothers and fathers, friendship support was associated with

maternal (but not paternal) trajectories, while family support was associated with paternal (but not maternal) trajectories. All of these effects held even when prenatal cortisol, socio-economic status, history of depression, father involvement, parental age and country of origin were included in the models. Below, we offer a brief commentary on some of these background contextual factors before discussing these three main sets of findings.

Associations between Anxious-Depressive Symptoms and Background Factors

Despite the predominantly well-educated and affluent nature of our study sample, participants' self-reported status (ratings on the Ladder of Social Standing) was significantly inversely associated with initial symptom levels. Likewise, despite having a relatively high median value, parental age was also inversely associated with initial symptom levels for mothers and with slopes for fathers (i.e., in each case, age was inversely related to the latent factor that was elevated in mothers and fathers, respectively). These findings converge with results from studies involving more diverse samples (J. Brown, Harris, Woods, Buman, & Cox, 2012; Singh-Manoux et al., 2003). These inverse associations indicate that becoming a parent at a relatively young age poses greater risk to well-being, even within a low-risk sample.

Dutch parents reported fewer initial symptoms of distress than British parents, but did not, on average, differ significantly from American parents. Future research involving more diverse samples is needed in order to test the replicability of this rather surprising finding. In particular, as demonstrated in an international analysis (Glass, Simon, & Andersson, 2016), country-level policies (e.g., relative childcare costs, parental leave, work flexibility) contribute to the adverse impact of parenthood on wellbeing. Dutch and British mothers are entitled to 6 weeks of paid maternity leave (at full pay for Dutch mothers and at 90% of full pay for British mothers), while Dutch and British fathers also receive at least one week of paternity leave at full pay. By contrast, alongside a small handful of other countries (Lesotho,

Liberia, Papua New Guinea and Swaziland), the USA provides no statutory maternity or paternity leave. In this context, the lack of group difference between parents in the USA and in either the UK or the Netherlands was unexpected but may reflect attributes of the specific sites (i.e., affluent New Yorkers are far from representative of the USA).

Comparing Mothers and Fathers for Anxious-Depressive Symptoms and Prenatal Cortisol.

With few exceptions (e.g., Hughes, Lindberg, & Devine, 2018; Piskernik, Supper, & Ahnert, in press), studies typically *assume* the equivalence of ratings from mothers and fathers. Yet early parenthood is characterized by a marked divergence between mothers' and fathers' roles and responsibilities (Kaźmierczak & Karasiewicz, 2018), with marked consequences that extend to the work-place and can be characterized as 'breadwinner-bonus' and 'caregiver-penalty' (Bear & Glick, 2017). As a result, qualitative contrasts in psychological distress may be expected. Against this view, however, our results demonstrate measurement invariance, supporting the conceptual equivalence of mothers' and fathers' self-reported anxious-depressive symptoms across the transition to parenthood.

Our dyadic longitudinal design enabled us to demonstrate within-couple associations for both the intercept *and* slope of the anxious-depressive symptoms latent factors. These associations highlight the need to extend mental-health checks to include fathers, who appear less likely than mothers to seek help (Vogel, Wester, Hammer, & Downing-Matibag, 2014). Theoretically, within-couple associations for both LGCM intercept and slope support accounts of 'spill-over' within family systems (Minuchin, 1985). While trajectories for maternal anxious-depressive symptoms showed significant variability, the close to zero slope for mothers suggested no mean change. Consistent with meta-analytic results (Paulson & Bazemore, 2010) paternal psychological distress gradually *increased* across the first two years of parenthood. Moreover, mean levels of anxious-depressive symptoms did not differ

significantly between mothers and fathers at each of the post-natal time points (Table S3). These results suggest the need for greater attention to the mental health of new fathers.

Consistent with previous reports of elevated cortisol in the third trimester of pregnancy (Mastorakos & Ilias, 2003), prenatal cortisol levels were higher in mothers than in fathers. Moreover, in line with previous findings (Mustonen et al., 2019), prenatal cortisol levels in mothers were associated with initial anxious-depressive symptoms; note that there was no corresponding association between prenatal cortisol and initial anxious depressive symptoms in fathers.

Comparing Mothers and Fathers for Sources of Support

Average levels of support from family or friends did not differ between mothers and fathers, but only fathers' anxious-depressive symptom trajectories were related to family support and only mothers' anxious-depressive symptom trajectories were related to friend support (see Figures 2A and 2B). This differential salience is open to several competing accounts. First, *mothers may attach greater importance to friendships than fathers* across the life-span, making them more susceptible to loneliness. Support for this view comes from a similar contrast between men and women in the salience of friend support within a study of American college youth (Lee & Goldstein, 2016). Second, *stable gender differences in the nature of friendships* (Field, 1999) may also contribute to greater buffering effects of friends for mothers than for fathers. Third, our results may reflect *gender-contrasts in new parents' willingness to seek help from family members* (c.f., Bost et al., 2002) such that all or most new mothers receive help from family, leading to variation in support from friends appearing more salient. Conversely, the *adverse effect of caregiver status on career opportunities* (Bear & Glick, 2017) may constrain fathers' help-seeking from friends at work. Overall, our findings suggest that health benefits may accrue from interventions that foster both expectant parents' help-seeking behaviours and support from friends and family.

Study Limitations and Strengths

Three key study limitations deserve note. First, our sample was predominantly well-educated and affluent. More work is needed to examine variation in psychological distress in new parents living in disadvantaged communities or in low and middle-income countries and among different family forms (e.g., same-sex couples, single parents). Caution is also needed in extrapolating our findings to single or multi-parous parents (e.g., Canário & Figueiredo, 2017). Second, shared reliance on self-reported ratings may have inflated the association with social support. More detailed measures of support (e.g., via ecological sampling) are therefore needed to explain the mechanisms underpinning buffering effects of social support. Third, while 85% of our families provided a saliva sample on at least one day for at least one parent, the need for rigorous control regarding the timing of saliva collection (within 30 minutes of waking for the first sample and within 15-45 minutes of waking for the second sample) resulted in a significant loss of data and hence reduced power. Fourth, practical constraints limited the collection of background data on participants (e.g., length of time cohabiting prior to birth, extent to which birth was planned). Further work is therefore needed to provide a finer-grained picture of factors that may moderate the impact of becoming a parent on wellbeing.

Equally, several strengths also deserve mention. The first of these is the assessment of both maternal and paternal psychological distress across four separate time-points over a 25-month period (Wee et al., 2011). Second, while the unidimensional focus on depression adopted in many previous studies fails to capture common experiences of anxiety and stress (Matthey, 2010), our anxious-depressive symptoms latent factor encompassed scores on three standardized measures (i.e., CESD, STAI and GHQ) and was supplemented by prenatal assessments of both maternal and paternal cortisol (Yim et al., 2015). Third, the validity of our findings was strengthened by our focus on first-time parents (avoiding confounding

effects of parity) and the direct assessment of conceptual equivalence in our measures of maternal and paternal psychological distress both across informants and over time. In addition, our novel dyadic longitudinal design allowed us to investigate variation in anxious-depressive symptom trajectories in both mothers and fathers and to examine similarities and differences in risk and protective factors. Our findings highlight social support as pivotal in enabling new parents to flourish.

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Table 1. *Descriptive Statistics and Reliability Information for Maternal and Paternal Questionnaires from Time 1 to Time 4.*

	Time 1				Time 2				Time 3				Time 4			
	M	***SD***	***N***	α	***M***	***SD***	***N***	α	***M***	***SD***	***N***	α	***M***	***SD***	***N***	α
Mother																
CESD20	9.67	5.88	426	.81	8.56	6.84	419	.87	9.01	7.20	390	.88	9.45	8.13	356	.91
GHQ12	1.97	2.16	426	.76	1.83	2.16	421	.79	1.80	2.45	391	.83	1.92	2.65	357	.86
STAI6	10.43	2.99	426	.76	10.45	3.07	419	.78	10.98	3.24	390	.80	10.80	3.20	356	.81
Friend Support	22.88	4.76	425	.94	22.53	5.03	414	.94	22.94	4.99	384	.94	22.87	5.28	351	.96
Family Support	22.97	5.14	425	.94	22.98	5.36	414	.93	22.94	5.28	384	.94	22.93	5.28	351	.94
Ladder													7.41	1.15	437	.85
Cortisol AUC_G	367.29	103.63	316	-												
Father																
CESD20	7.34	5.97	401	.84	8.63	7.39	385	.88	9.31	7.54	362	.89	9.18	7.54	327	.88
GHQ12	1.37	2.01	390	.81	1.61	2.49	390	.85	1.61	2.53	362	.87	1.69	2.52	330	.86
STAI6	10.90	2.84	402	.71	10.80	3.34	386	.81	10.98	3.32	362	.81	10.90	3.39	328	.83
Friend Support	21.26	5.06	400	.93	21.00	5.42	380	.94	20.52	5.62	360	.94	20.41	5.75	324	.95
Family Support	21.54	5.28	400	.91	21.75	5.22	380	.91	21.87	5.25	360	.91	21.33	5.80	324	.92
Ladder													7.34	1.22	437	.84
Cortisol AUC_G	240.64	91.84	309	-												
Couple																
Relationship	29.99	2.04	425	.69	30.09	2.02	425	.67	29.74	2.02	402	.63	29.78	2.30	380	.74
Childcare													3.90	0.78	434	.82

Note. CESD20 = Center for Epidemiological Studies Depression Scale. GHQ12 = General Health Questionnaire. STAI6 = State-Trait Anxiety Inventory. Ladder = Mean Rating from T2 to T4 on Ladder of Subjective Social Standing. Cortisol AUC_G = Salivary cortisol area under the curve with respect to ground. Relationship = mean of mother and father ratings on the Conflict Tactics Scale. Childcare = Mean of mother and father ratings of parental involvement in childcare from Time 2 to Time 4.

Table 2. *Estimated Correlations between latent variables and covariates for mothers (below diagonal) and fathers (above diagonal) and between mothers and fathers (on diagonal).*

		1	2	3	4	5	6	7	8	9	10	11
1	Age (Years)	*.644***	.185**	.012	.140**	.038	-.075	.162*	-.148	-.155*	-.011	-.068
2	History of Depression/Anxiety	-.012	*.253***	-.104	-.061	-.017	.034	.204**	.152	.013	-.043	-.113
3	Ladder of Social Standing	.205**	-.099	*.481***	.368**	.030	-.121*	-.336**	-.188	.229**	.202**	.161
4	Education	.302**	.008	.375**	*.446***	.081	-.036	-.063	-.042	.014	.078	.053
5	Childcare	.121	-.017	.035	.074	-	.041	-.058	.048	.056	.068	.155*
6	Cortisol	-.024	-.097	-.084	-.097	.072	*.165***	.021	.012	-.003	.018	-.027
7	Anx-Dep Intercept	-.168**	.265**	-.328**	-.144*	.057	.205**	*.185***	.143*	-.336**	-.289**	-.265**
8	Anx-Dep Slope	.063	.032	-.033	.050	-.046	-.193*	.026	*.372***	-.265**	-.224*	-.151
9	Family Support	-.085	-.227**	.175**	-.004	-.006	-.003	-.241**	-.361**	*.323***	.509**	.227**
10	Friendship Support	0	-.171**	.146*	.072	.025	-.012	-.213**	.445**	.543**	*.331***	.132*
11	Couple Relationship	-.134*	-.142*	.090	.053	.155*	.022	-.217*	-.019	.238**	.138*	-

Note. ***p* < .01. **p* < .05. Couple relationship and Childcare were comprised of indicators completed by mothers and fathers and are therefore a couple-level variable.

Table 3. *Unstandardized and Standardized Robust Maximum Likelihood Estimates for Conditional LGCM.*

	Mother				**Father**			
	Latent Intercept		**Latent Slope**		**Latent Intercept**		**Latent Slope**	
Predictors	**Est. (SE)**	**Std. Est.**	**Est. (SE)**	**Std. Est.**	**Est. (SE)**	**Std. Est.**	**Est. (SE)**	**Std. Est.**
Country (UK vs. NL)	-1.39 (0.66)	-.14*	0.24 (0.20)	.12	-2.68 (0.60)	-.25**	0.09 (0.17)	.04
Country (UK vs. USA)	0.65 (0.61)	.07	0.16 (0.19)	.08	0.83 (0.74)	.08	0.29 (0.21)	.15
Age (Years)	-0.17 (0.07)	-.15*	0.01 (0.02)	.03	0.10 (0.07)	.10	-0.04 (0.02)	-.22*
History of Depression/Anxiety	2.01 (0.75)	.18**	-0.17 (0.21)	-.07	2.12 (0.90)	.14*	0.47 (0.37)	.17
Ladder of Social Standing	-0.85 (0.27)	-.23**	0.02 (0.07)	.02	-0.99 (0.29)	-.25**	-0.08 (0.08)	-.11
Highest Level of Education	0.06 (0.24)	.02	0.03 (0.07)	.04	0.15 (0.20)	.05	0.05 (0.05)	.08
Childcare	0.49 (0.38)	.09	-0.09 (0.11)	-.08	-0.01 (0.36)	-.001	0.01 (0.10)	.01
Family Support	-0.11 (0.11)	-.09	-0.05 (0.03)	-.19	-0.24 (0.12)	-.17*	-0.06 (0.03)	-.21*
Friendship Support	-0.11 (0.11)	-.08	-0.10 (0.03)	-.36**	-0.17 (0.10)	-.13	-0.02 (0.03)	-.07
Couple Relationship	-0.60(0.24)	-.18*	0.08 (0.08)	.11	-0.55 (0.25)	-.15*	-0.04 (0.08)	.05
Partner Latent Intercept			0.02 (0.02)	.12			0.02 (0.02)	.10
Cortisol AUC_G	7.31 (2.99)	.18*	-1.57 (0.85)	-.18	-0.63 (3.82)	-.01	-0.11 (0.95)	-.01

Note. ***p <.001. **p<.01. *p<.05.

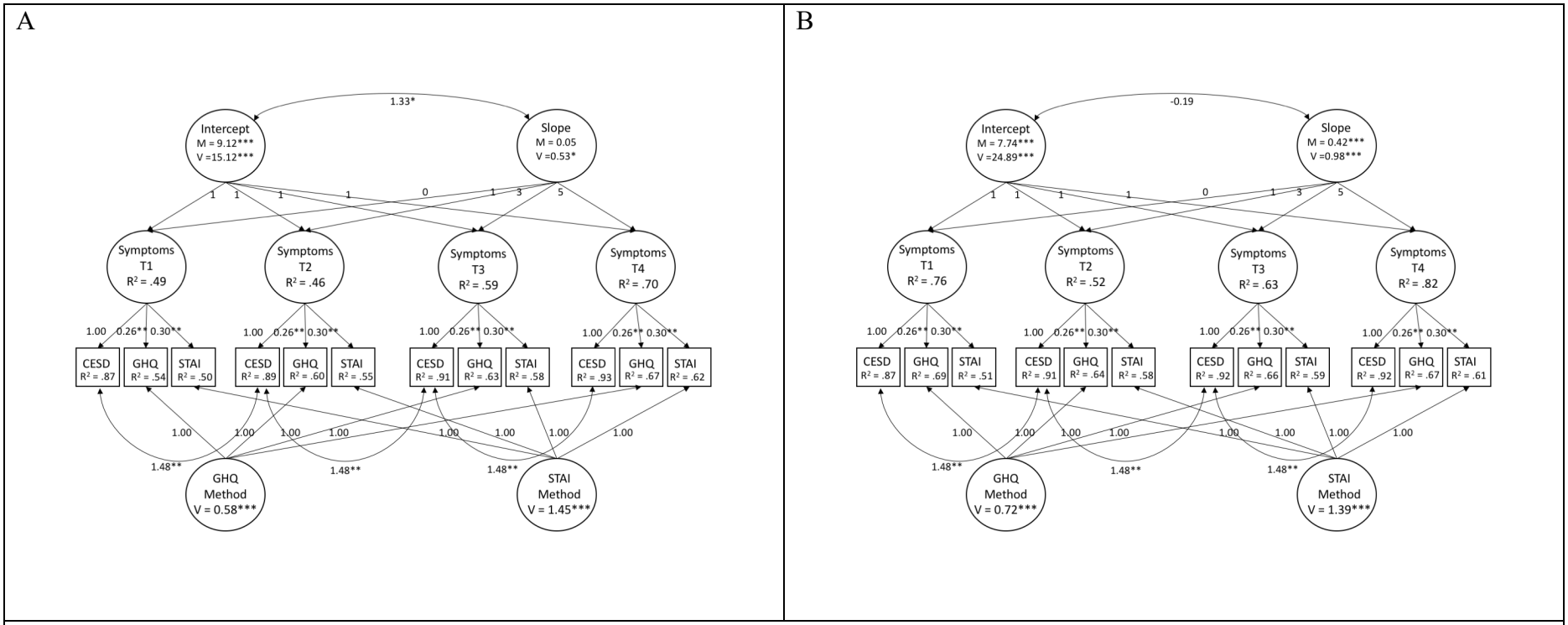
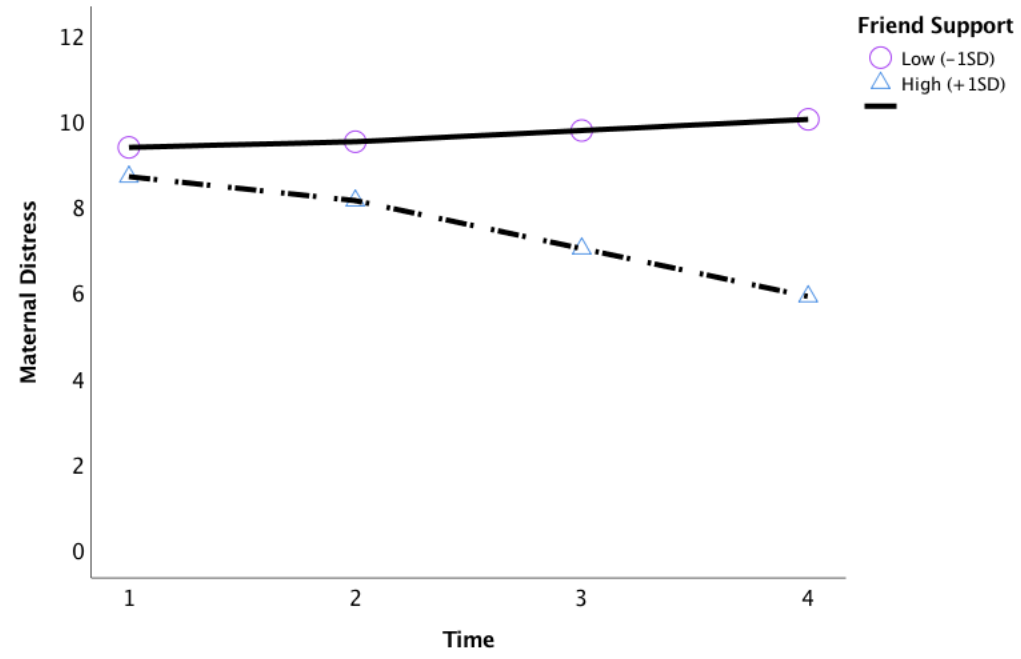
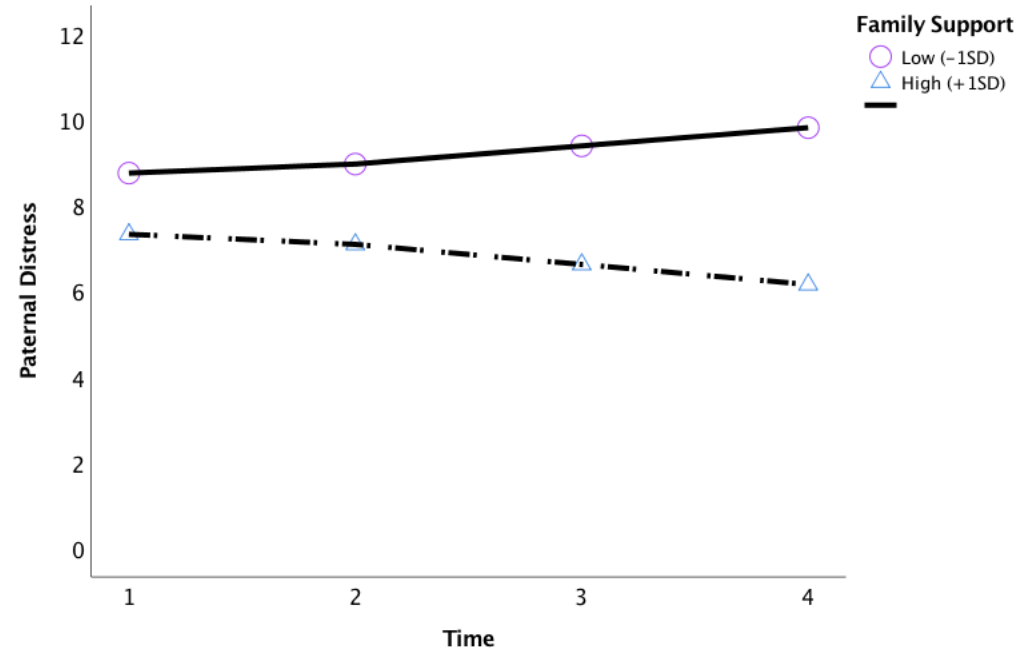


Figure 1. *Robust Maximum Likelihood Estimates for Maternal (A) and Paternal (B) Unconditional Latent Growth Curve Models of Anxious-Depressive Symptoms Across the Transition to Parenthood.*

Note. ***$p < .001$. **$p < .01$. *$p < .05$. CESD = Center for Epidemiological Studies Depression scale. GHQ = General Health Questionnaire. STAI = State-Trait Anxiety Inventory. Symptoms = Anxious-Depressive Symptoms. T = Time point.



A



B

Figure 2. Panel A depicts Perceived Support from Friends and Maternal Trajectories of Psychological Distress Across the Transition to Parenthood. Panel B depicts Perceived Support from Family and Paternal Trajectories of Psychological Distress Across the Transition to Parenthood.

Couples Becoming Parents: Trajectories for Psychological Distress and Buffering Effects of Social Support

Online Supplementary Material.

Additional Information About Data Analysis.

Missing Data.

Complete screening data were available for 437 mothers and 436 fathers and these data were used as predictors of whether questionnaire data were missing for two or more time points in the study. Maternal missing data was unrelated to age, B =0.033, *SE* = 0.25, *Wald* (1) = 0.017, *p* = 0.89, child gender, B = -0.058, SE = 0.374, *Wald* (1) = 0.024, *p* = 0.88, perceived social standing, B =0.204, *SE* = 0.18, *Wald* (1) = 0.024, *p* = 0.88, or initial levels of depressive symptoms on the GHQ12, *B* = 0.062, *SE* = 0.099, *Wald* (1) = 0.387, *p* = 0.53. Paternal missing data was unrelated to paternal age, *B* = 0.035, *SE* = 0.18, *Wald* (1) = .039, *p* = 0.84, child gender, B = -0.080, SE = 0.259, *Wald* (1) = 0.096, *p* = 0.76, perceived social standing, *B* = 0.088, *SE* =0.12, Wald (1) = 0.595, *p* = 0.44, or initial levels of depressive symptoms on the GHQ12, *B* = -0.066, SE = 0.087, *Wald* (1) = 0.575, *p* = 0.45. Missing data were therefore judged to be missing at random.

Measurement Models.

To create a measure of anxious-depressive symptoms, we tested a one factor model for mothers and fathers in which total scores from the CESD20, GHQ12 and STAI6 loaded onto a single latent factor at each time point. Note that the CFAs were performed on the raw scores of each indicator. We set the lead indicator intercept to 0 for each latent factor and freely estimated each latent factor mean (Geiser, 2013). We permitted the residuals for the lead indicator (CESD20) to correlate with adjacent time points in both mothers and fathers. To account for measure-specific variance, we also estimated a method factor for the GHQ12 and the STAI6 by allowing indicators from each questionnaire to load onto separate measure-

specific latent factors. We fixed the factor loadings for each indicator on the measure-specific latent factors to 1 to reflect the fact that the indicator was the same at each time point (Geiser, 2013). These method factors were residual factors and so were not permitted to co-vary any other latent factor in the model (Geiser, 2013). This measurement model provided a good fit to the data, χ^2 (214) = 346.492, $p < .001$, RMSEA = 0.038, CFI = 0.968, TLI = 0.959. Figure S1 shows the unstandardized estimates for the anxious-depressive symptoms latent factors in (A) mothers and (B) fathers across the transition to parenthood. Standardized factor covariances (in parentheses) show longitudinal stability of individual differences in symptoms in both mothers.

Since mothers and fathers in our study were nested within couples (i.e., non-independent), we tested whether latent factors were invariant by using methods traditionally applied to repeated-measures data instead of a multiple-groups approach. We imposed equality constraints on the anxious-depressive symptom latent factors both across informants and over time to investigate the measurement invariance of the latent factor in mothers and fathers over time. Table S1 shows the results for the nested model comparisons. We inspected the modification indices to identify areas of strain within the model and adjusted the model when these modification indices were theoretically meaningful. The GHQ12 intercepts were higher at Time 2 than at any other time point for both fathers, *Est.* = -0.446, *SE* = 0.097, and mothers, *Est.* = -0.412, *SE* = 0.100. The intercepts for the STAI6 were higher in fathers at Time 1 than at later time points, T1 *Est.* = 8.631, *SE* = 0.138, but lower in mothers at T1 than at later time points, T1 *Est.* = 7.554, *SE* = 0.160. The residual variance in the GHQ12 was lower at T1 than at later time points in fathers, T1 *Est.* = 1.405, *SE* = 0.203. With the exception of these parameters, all parameters were invariant across informants and over time. The partial measurement invariance model (in which these parameters were free to vary) provided a good fit to the data, χ^2 (263) = 400.911, $p < .0001$, RMSEA = 0.035, CFI =

0.967, TLI = 0.966. Table S2 shows the results of model comparisons testing latent factor mean differences within participants (over time) and between mothers and fathers.

To create a measure of perceived family support and friendship support, we tested a two-latent factor model for mothers and fathers in which total scores for perceived family support from T1 to T4 loaded onto one latent factor and total scores for perceived friendship support from T1 to T4 loaded onto a second correlated latent factor. Note that prior to the CFA, we mean-centered each of the indicators to set the latent factor means to 0 in order to facilitate interpretation of the latent growth curve models (Newsom, 2015). To account for wave-specific measurement error, we permitted indicators from within the same time point to co-vary. This model provided an acceptable fit to the data, χ^2 (90) = 126.296, p = 0.007, RMSEA = 0.030, CFI = 0.984, TLI = 0.978. Inspection of the modification indices revealed that permitting the T1 and T2 Family Support indicators to covary in both mothers and fathers would improve model fit. This adjusted model provided a good fit to the data, χ^2 (88) = 93.116, p = 0.334, RMSEA = 0.012, CFI = 0.998, TLI = 0.997. Figure S2 shows the unstandardized estimates for the friend and family support latent factors in mothers and fathers.

To this model we added a fifth latent factor to capture between-couple differences in couple conflict. We tested a model in which the T1 to T4 couple conflict indicators loaded onto a single latent factor. The extended model provided a good fit to the data, χ^2 (150) = 191.672, p = 0.012, RMSEA = 0.025, CFI = 0.987, TLI = 0.984. Inspection of the modification indices revealed that permitting adjacent indicators on the couple conflict latent factor (i.e., T1 and T2, T3 and T4) to correlate would improve model fit. The revised model fit the data well, χ^2 (148) = 176.246, p = 0.056, RMSEA = 0.021, CFI = 0.991, TLI = 0.989. The variance of the couple conflict latent factor differed significantly from 0, Unstandardized Estimate = 1.847, SE = 0.380, $p < 0.001$, and each item loaded significantly onto the latent

factor (standardized loadings ranged from .67 to .92). Couple conflict was weakly (but significantly) associated with maternal family support, $r = .24$, $p < .001$, and friend support, $r = .14$, $p = .036$, and with paternal family support, $r = .22$, $p < .01$, and friend support, $r = .14$, $p = .02$.

To examine the equivalence of the family support and friendship support latent factors across mothers and fathers (within the same couple), we compared the fit of a series of nested models with increasing constraints on model parameters following established procedures (Geiser, 2013; Newsom, 2015). Having established the *configural invariance* of each of the latent factors (i.e., the same factor structure applied in both mothers and fathers), we tested for *weak factorial invariance* by constraining factor loadings to be the same in mothers and fathers, then *strong factorial invariance* by constraining indicator intercepts to be the same in mothers and fathers, and finally *strict factorial invariance* by constraining the residual variances to equality across mothers and fathers (Geiser, 2013). Table S2 presents the results of the nested model comparisons for the Family Support and Friendship Support latent factors. Model fit did not degrade substantially with increasing constraints indicating that the Family Support and Friendship Support latent factors exhibited strict factorial invariance across mothers and fathers.

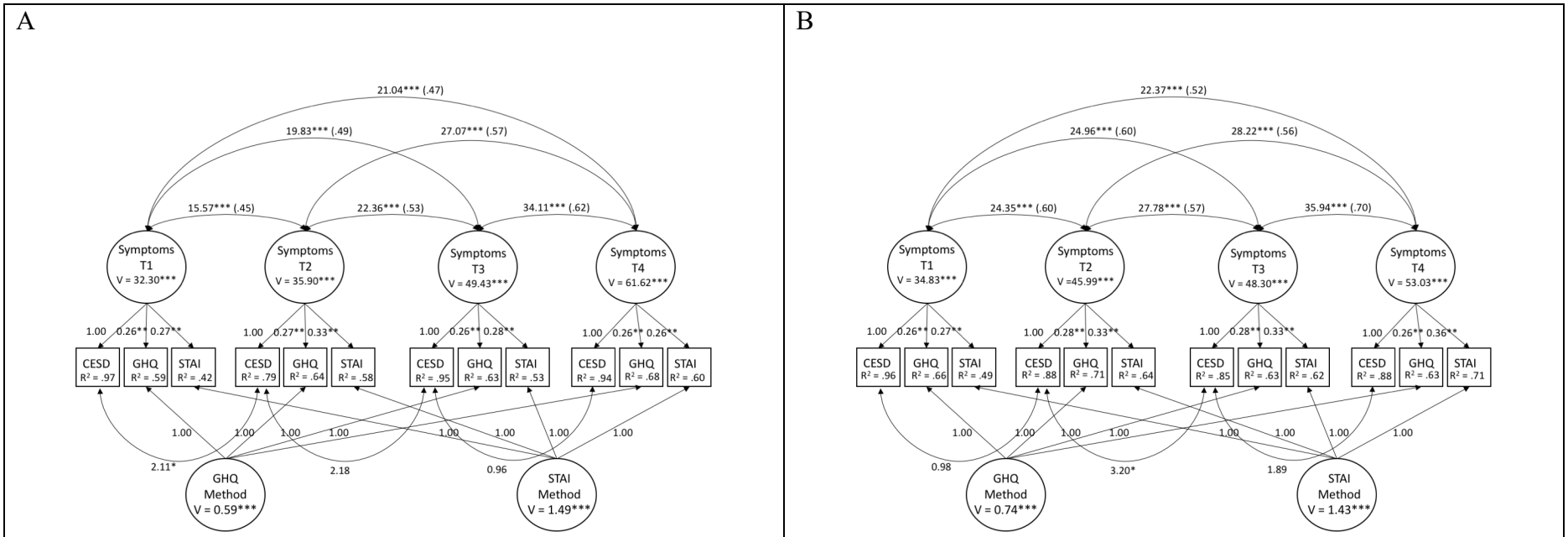


Figure S1. *Robust Maximum Likelihood Estimates for Maternal (A) and Paternal (B) Anxious-Depressive Symptoms Across the Transition to Parenthood.*

Note. ***$p < .001$. **$p < .01$. *$p < .05$. CESD = Center for Epidemiological Studies Depression scale. GHQ = General Health Questionnaire. STAI = State-Trait Anxiety Inventory. Symptoms = Anxious-Depressive Symptoms. T = Time point.

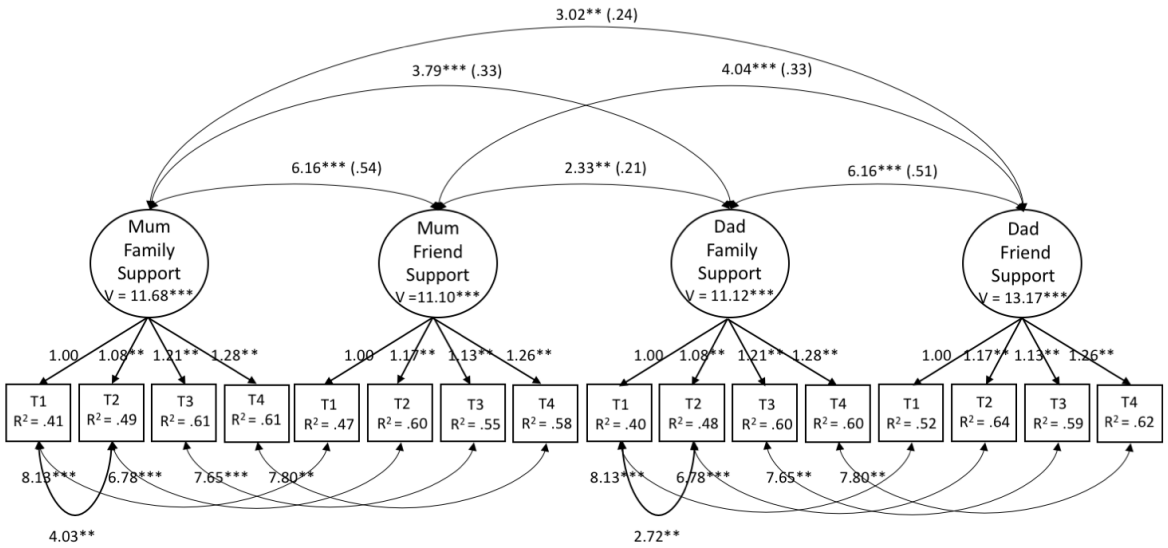


Figure S2. Robust Maximum Likelihood Estimates for Maternal and Paternal Perceived Family and Friendship Support.

Note. ***$p < .001$. **$p < .01$. *$p < .05$. Standardized estimates are shown in parentheses. V = Variance.

Table S1. *Measurement Invariance for Anxious-Depressive Symptoms in Mothers and Fathers From T1 to T4.*

		Model Fit Indices						Changes in Model Fit			
Model	**Test of Invariance**	**χ^2**	***df***	**RMSEA**	**CFI**	**TLI**	**Comparison**	**SB$\Delta\chi^2$**	**Δdf**	***p***	**ΔCFI**
1	Baseline Model (1.0929)	346.492	214	0.038	0.968	0.959	-	-	-	-	-
2	Equal Loadings (1.1144)	359.720	228	0.036	0.969	0.962	2 vs. 1	15.38	14	.352	+0.001
3	Equal Intercepts (1.1083)	425.272	242	0.042	0.956	0.950	3 vs. 2	69.83	14	.0001	-0.014
4	Equal Intercepts GHQ12 (1.1112)	376.069	235	0.037	0.966	0.961	4 vs. 2	16.89	7	.018	-0.003
5	Equal Intercepts GHQ12[a.] (1.1117)	368.233	233	0.036	0.968	0.962	5 vs. 2	8.59	5	.126	-0.001
6	Equal Intercepts STAI6 (1.1087)	415.993	240	0.041	0.958	0.952	6 vs. 5	51.39	7	.0001	-0.010
7	Equal Intercepts STAI6 [b.] (1.1086)	377.873	238	0.037	0.967	0.961	7 vs. 5	9.90	5	.078	-0.001
8	Equal Residuals (1.1491)	416.771	259	0.037	0.962	0.960	8 vs. 7	37.31	21	.016	-0.005
9	Equal Residuals CESD20 (1.1183)	390.687	245	0.037	0.965	0.961	9 vs. 7	14.43	7	.044	-0.002
10	Equal Residuals GHQ12 (1.1414)	410.196	252	0.038	0.962	0.959	10 vs. 9	16.05	7	.025	-0.003
11	Equal Residuals GHQ12[c.] (1.1379)	393.371	251	0.036	0.966	0.963	11 vs. 9	5.53	6	.478	+0.001
12	Equal Residuals STAI6 (1.1457)	399.964	258	0.035	0.966	0.964	12 vs. 11	7.452	7	.383	0
13	Equal Residual Covariance (1.1493)	400.911	263	0.035	0.967	0.966	13 vs. 12	1.894	5	.863	+0.001

Note. The scaling correction factor for each model is reported in parentheses. [a.] GHQ12 Intercepts at Time 2 free to vary. [b.] STAI6 Intercepts at T1 for mums and dads free to vary. Modification indices did not highlight any other source of misfit with intercept constraints. [c.] GHQ12 T1 residual for dads freed to vary over time. The overall difference between Model 1 and Model 13 was SB$\Delta\chi^2$ (49) = 58.82, p = .159, ΔCFI = 0.001, supporting partial measurement invariance.

Table S2. *Comparison of Latent Factor Means Over Time and Across Informants*

Comparison	M_1 (SE_1)	M_2 (SE_2)	**Wald Test**	***df***	***p***	***w***
Between Informants						
Mother Mean T1 vs. Father Mean T1	9.659 (0.286)	7.454 (0.299)	35.755	1	0.00001	.285
Mother Mean T2 vs. Father Mean T2	8.442 (0.327)	8.617 (0.362)	0.163	1	0.6865	.019
Mother Mean T3 vs. Father Mean T3	9.130 (0.357)	9.405 (0.389)	0.390	1	0.5323	.029
Mother Mean T4 vs. Father Mean T4	9.661 (0.412)	9.546 (0.416)	0.055	1	0.8143	.011
Within Informants						
Mothers						
Mother Mean T1 vs. Mean T2	9.659 (0.286)	8.442 (0.327)	14.353	1	0.0002	.181
Mother Mean T1 vs. Mean T3	9.659 (0.286)	9.130 (0.357)	2.391	1	0.1220	.073
Mother Mean T1 vs. Mean T4	9.659 (0.286)	9.661 (0.412)	0.000	1	0.9950	0
Mother Mean T2 vs. Mean T3	8.442 (0.327)	9.130 (0.357)	3.838	1	0.0501	.094
Mother Mean T2 vs. Mean T4	8.442 (0.327)	9.661 (0.412)	10.327	1	0.0013	.154
Mother Mean T3 vs. Mean T4	9.130 (0.357)	9.661 (0.412)	2.109	1	0.1464	.069
Fathers						
Father Mean T1 vs. Mean T2	7.454 (0.299)	8.617 (0.362)	13.320	1	0.0003	.174
Father Mean T1 vs. Mean T3	7.454 (0.299)	9.295 (0.391)	30.935	1	0.00001	.265
Father Mean T1 vs. Mean T4	7.454 (0.299)	9.468 (0.418)	27.696	1	0.00001	.251
Father Mean T2 vs. Mean T3	8.617 (0.362)	9.405 (0.389)	4.625	1	0.0315	.103
Father Mean T2 vs. Mean T4	8.617 (0.362)	9.546 (0.416)	5.210	1	0.0225	.109
Father Mean T3 vs. Mean T4	9.405 (0.389)	9.546 (0.416)	0.150	1	0.6984	.019

Table S3. *Measurement Invariance for Family Support and Friendship Support Latent Factors Across Mothers and Fathers.*

		Model Fit Indices						Changes in Model Fit			
Model	**Test of Invariance**	**χ^2**	***df***	**RMSEA**	**CFI**	**TLI**	**Comparison**	**SB$\Delta\chi^2$**	**Δdf**	***p***	**ΔCFI**
1	Equal Form (1.1651)	93.116	88	0.012	0.998	0.997	-	-	-	-	-
2	Equal Factor Loadings Friend Support (1.1482)	103.844	91	0.018	0.994	0.992	2 vs. 1	16.467	3	.001	-0.004
3	Equal Factor Loadings Friend & Family Support (1.1561)	109.576	94	0.019	0.993	0.991	3 vs. 2	5.335	3	.149	-0.001
4	Equal Intercepts Friend Support (1.1497)	110.229	97	0.018	0.994	0.993	4 vs. 3	0.052	3	.997	+0.001
5	Equal Intercepts Friend and Family Support (1.1439)	111.094	100	0.016	0.995	0.994	5 vs. 4	0.366	3	.947	+0.001
6	Equal Residuals Friend Support (1.2323)	113.614	104	0.015	0.996	0.995	6 vs. 5	3.755	4	.440	+0.001
7	Equal Residuals Friend & Family Support (1.2726)	113.720	108	0.011	0.997	0.997	7 vs. 6	2.031	4	.730	+0.001
8	Equal Error Covariances (1.3170)	117.080	113	0.009	0.998	0.998	8 vs. 7	4.163	5	.526	+0.001
9	Equal Factor Covariances (1.3175)	119.255	114	0.010	0.998	0.998	9 vs. 8	2.128	1	.145	0

Note. The scaling correction factor for each model is reported in parentheses. Although there was a significant decrease in model fit between model 1 and model 2, the modification indices revealed no areas of strain. The overall difference between Model 1 and Model 9 was SB$\Delta\chi^2$ (26) = 26.52, p = .435, ΔCFI = 0, supporting measurement invariance.